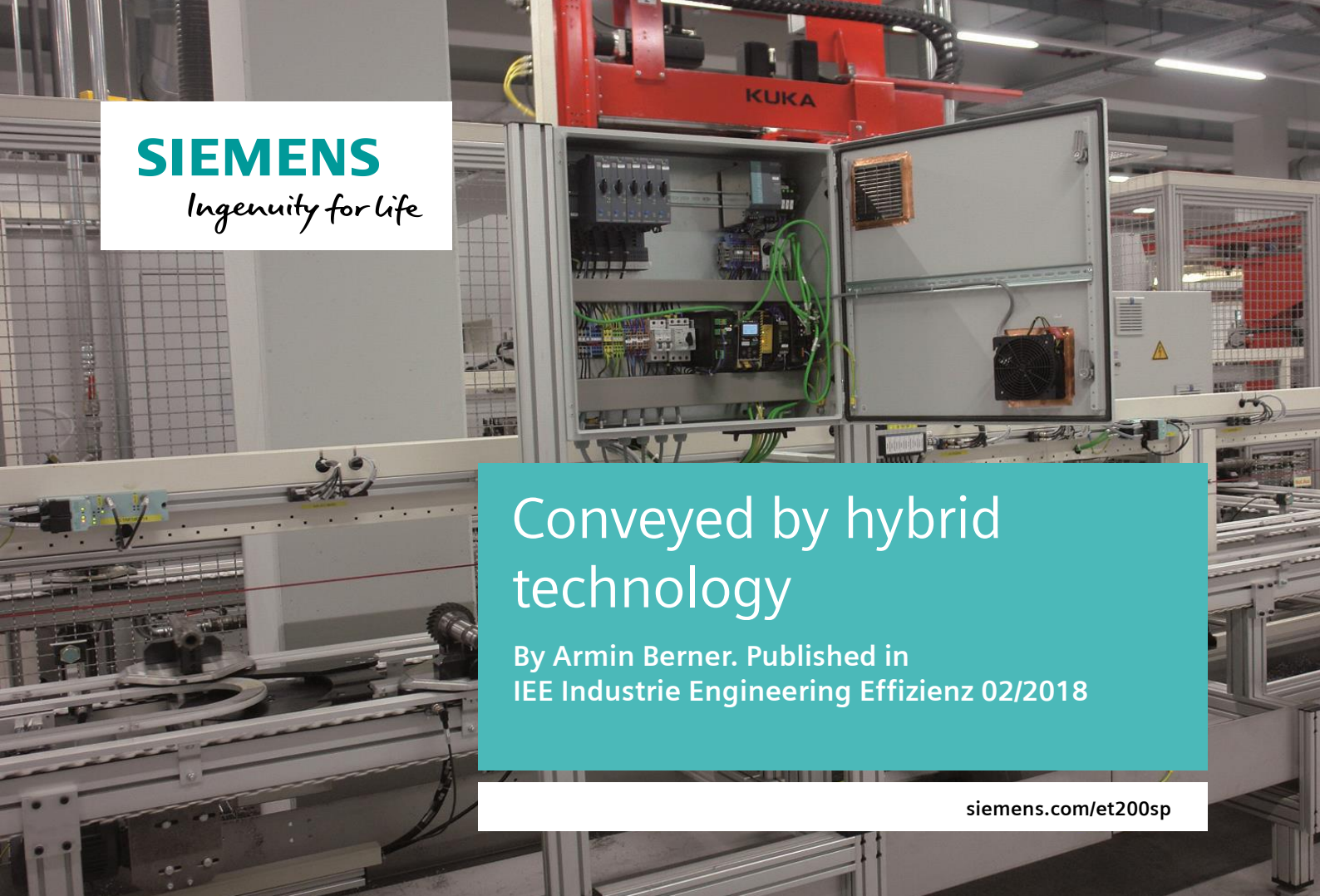




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Ingenuity for life



Conveyed by hybrid technology

By Armin Berner. Published in IEE Industrie Engineering Effizienz 02/2018

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Companies that build machines and plants for their own use examine new technologies very carefully. HES Erkert GmbH, for example, a renowned supplier for the automotive industry, has done just that. The company is keen to deploy innovative solutions in production, but only if decision-makers are convinced of the value added they will provide. The Simatic ET 200SP motor starter from Siemens made the cut. This is to the benefit of the conveyor belts between the machine tools on which the workpieces are now conveyed by means of hybrid technology.

To put it simply, it is just a question of replacing a combination of contactor and circuit breaker with a modern motor starter incorporating hybrid technology", Horst Schmid, Head of the Electrical Engineering department at HES Erkert Präzisionsteile GmbH in Sulzbach an der Murr, Germany, explains the core of the matter. However, he is well aware that it is a giant leap made possible by the innovative starter technology. The automation expert appreciates the extensive functionality of today's motor starters

and is keenly following their development.

Background: HES Erkert Präzisionsteile GmbH with its approx. 1400 employees is one of Germany's major job shop manufacturers and is therefore an important supplier for the automotive industry. To keep up with the times, the company develops and builds many production solutions itself in its 'special machine building' business unit. The chains alone between the several hundred machine tools for milling, turning, drilling, grinding, cold rolling, etc. add up to more than a kilometer, Horst Schmid estimates: "As we use many thousands of electric motors in our three plants, any optimization immediately has a positive impact on costs, work and production performance, stocks and availability," as he knows from many years of experience.

Compact and simple starter solution for conveyor technology

Recently, the modular Simatic ET 200SP motor starter from Siemens became his first choice for efficiently chaining machine tools and conveying

workpieces. The advantages it has are clearly felt in many areas. Chief among them is the compact design of the devices, which, with an overall width of 30 mm, only take up a third of the space that the predecessor ET 200S, also in use there for many years, did. In this way, the control cabinets can be dimensioned considerably smaller to integrate them even more elegantly into overall automation.

Practitioners appreciate this advantage: "In this way, we considerably reduce the size of our control cabinets and the installation work is cut by half compared with conventional motor feeders because of the eliminated devices, such as terminal blocks, infeeds, power supplies, etc." The spring-loaded terminals consistently used in Sulzbach an der Murr also ensure time savings. This eliminates wire end ferrules and contacting of cables can be completed much faster than with screw connections. This connection method is also vibration-proof and provides a defined contact resistance.

Just four size graduations per starter version (direct-on-line, reversing,

fail-safe direct-on-line, and fail-safe reversing starters) cover the power range up to 5.5 kW. From a practitioner's point of view, this has considerable advantages in terms of configuration, procurement, installation, and inventory: "Most of our conveyor lines require a motor drive power ranging between 1.1 kW and 1.6 kW, which means that we usually manage with just one type of starter." That simplifies overall handling and, in itself, saves ten minutes per starter on initial installation compared with the predecessor version. And even if a motor with a different power than planned is mounted, the Electrical Engineering department saves the next ten minutes during reparameterization of the motor starter.

The "TIA Portal" program tool makes everything easier

The reason for this is the use of the "TIA Portal" engineering framework from Siemens. This comprehensive tool for configuration, programming, parameterization and visualization does on a single platform what was previously achieved with individual programs such as Step 7, WinCC and Starter. Horst Schmid is pleased about this huge technological leap: "The possibilities and rationalization effects

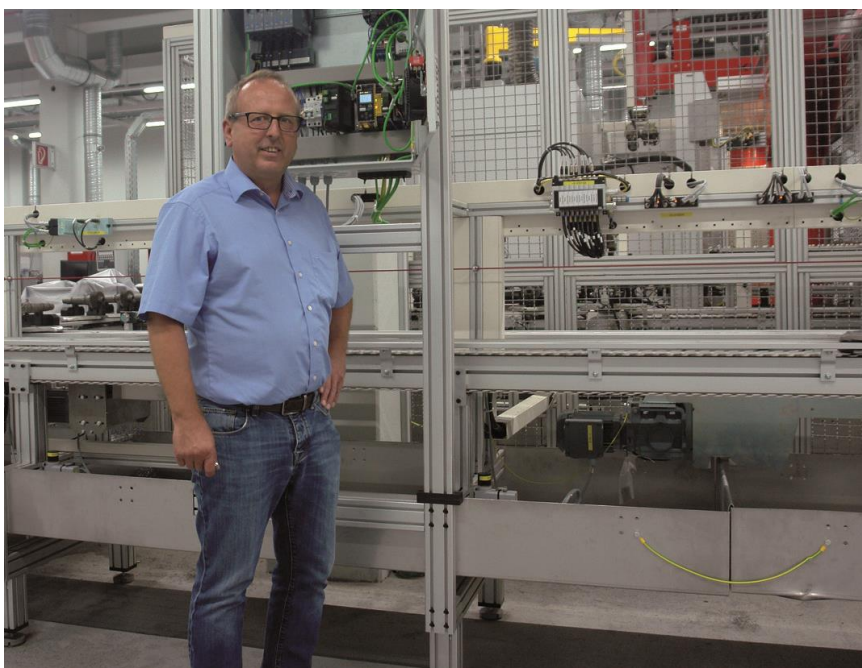
associated with this are so huge that we decided to use this new, modern technology from the outset." The use of the new ET 200SP motor starter is a further step in this direction because it is integrated completely into the TIA Portal and therefore creates further potential for rationalization. In addition to the bus connection, which was already present in the predecessor, the new motor starters now provide a host of important diagnostic information from the field to the control and management level via the TIA Portal. "For example, we use the residual-current evaluation to detect immediately when a conveyor belt drive is not working," the automation expert reports. The possibility of current measurement also provides information about wear or operational disruptions. Ultimately, that is an important prerequisite for preventive maintenance. "Because our plants usually run in 3-shift operation, unscheduled stoppages are an absolute no-go," Horst Schmid points out.

Electronics in the starter provide important diagnostics and information

Such diagnostic information was just as impossible in the past as, for example, simple acquisition of starts and operating hours. With this easily gen-

erated data, it will be possible in the future to obtain further information about the wear behavior of the motors used and therefore design production management more efficiently. "Because of increasing digitalization, we then 'know' what is likely to happen and perform the relevant service in a planned way," the Head of the Electrical Engineering department stresses.

These advantages are obtained with considerably more electronics in the motor starter than in the past. For this reason, the extremely compact Sirius 3RM1 motor starter, which can switch motors up to a maximum power of 3 kW via the power electronics, has been used at HES Erkert as an alternative to the ET 200S for a long time. The advantages of both solutions are now combined in one device with the new Simatic ET 200SP motor starter: the devices switch electronically via the integrated power semiconductors, but then, having reached the operating state, a contact-based system takes over the flow of power to the motor. Horst Schmid is enthusiastic: "In this way, the motor starters are integrated deeply into our digitalization strategy, yet require scarcely more current than a purely contactor-based motor feeder. So they work just as energy-efficiently,



Horst Schmid, Head of the Electrical Engineering department at HES Erkert Präzisionsteile in Sulzbach an der Murr: "We benefit from the new motor starters with hybrid technology in many ways – we save engineering work, space, installation time and also gain important information about the automation system."



The space requirement makes all the difference: the new ET 200SP motor starters save about two thirds of the space in the control cabinet taken up by the previous ET 200S solution.

but provide us with a lot more options in automation."

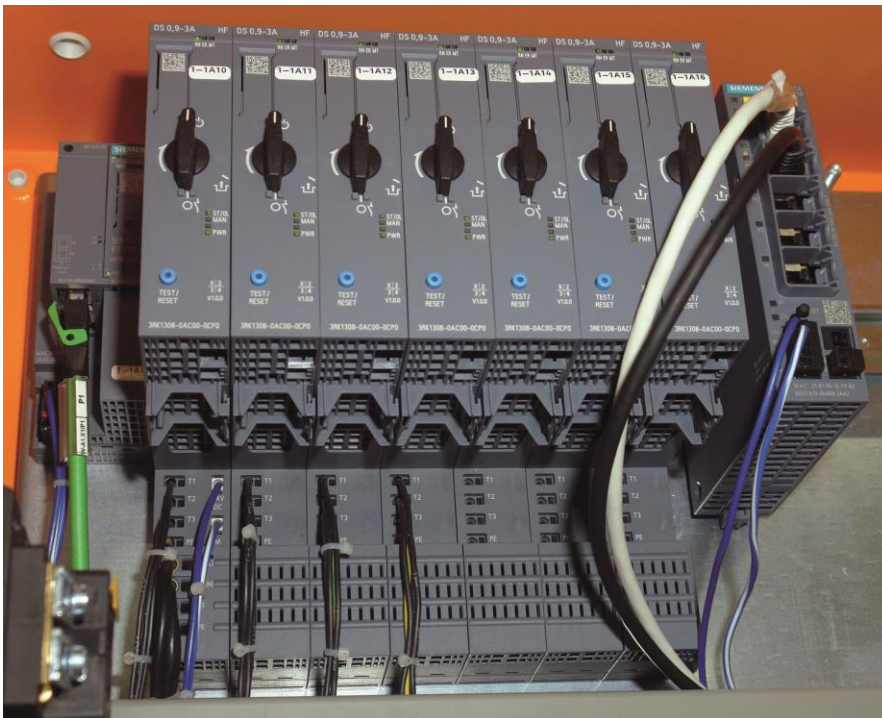
Motor starters for greater production performance, economic efficiency and energy efficiency

High energy efficiency, compact design, simple handling throughout the process and simple integration into digitalization fully in line with "Industrie 4.0" are the main advantages over conventional motor feeders with a contactor and motor circuit protector. The ET 200SP motor starters also considerably reduce service work. This is important because, with the continuous load and the large number of motors in the conveyor lines,

the 33 employees in Horst Schmid's department are not infrequently called in for service assignments. Due to the continuous load, for example, several dozen contractors with welded contacts must be replaced each year.

"That's all in the past now because the hybrid technology takes care of switching the contactors and the ET 200SP motor starters can work free of wear," the practitioner is happy to report. Quick side-by-side mounting of the individual motor starter modules produces a clear configuration while also building the common power bus for the power supply. A motor starter module of this type can also be removed and replaced just as easily by

pulling it out towards the front during service work. Parameterization is performed automatically via a parameter upload, which considerably speeds up service assignments. This increases the availability of the production plants and therefore the economic efficiency of overall production. Horst Schmid sums up: "The Simatic ET 200SP motor starter from Siemens with its hybrid technology again makes it clear that innovative solutions also result in many small improvements at the field level and therefore make a considerable contribution to the overall results, namely by increasing production performance, economic efficiency and energy efficiency.



The modular Simatic ET 200SP motor starters from Siemens can simply be mounted side by side and configured, programmed and parameterized via the TIA Portal. The self-assembling power bus in conjunction with the spring-loaded connection technology result in a substantial time saving during installation.

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